GLOBAL RESEARCH TRENDS AND SCIENTIFICPRODUCTIVITY IN THE FIELD OF VIROLOGY OVERLAST THREEDECADES:ASCIENTOMETRICSVIEW

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1. INTRODUCTION

This study reviews virology research mainly published in the web of sciencedatabase from 1991 to 2021 with the combination of scientometric analysis and criticalreview. Virology is a branch of microbiology that investigates a wide range of viraldiseasesthatcausesignificantmorbidityandmortalityinhuman,animal,andplantpopulati ons all over the world. The increasing interest in virology is linked to the fact thatwe should know details about viruses understand their links to viral diseases deeply andthatepidemiologylooksatcertainviralinfectionsdifferently:allofasuddenwerecognizevir uses where we did not see them before. Martinus W. Beijerinck is father of Virology,who was the first to recognize that viruses are reproducing entities that are different fromotherorganisms.

Theterm‘Scientometrics’wasoriginatedfromaRussianword(naukometriya)andcoine d by Vassily V.Nalimov and Z.M.Mulchenko in the year 1969. This term is mainlyused for the study of all aspects of the literature of science and technology. The term hadgainedwiderecognitionintheyear1978bythefoundationofthejournal‘Scientometrics’byT iberBrauninHungary.Accordingtoitssubtitle,Scientometricsincludesallquantitativeaspectso fthescienceofscience,communicationinscienceandsciencepolicy.

2. REVIEWOFLITERATURE

Reviewingrelatedliteratureisaprimaryandintegralpartofanyresearch,itenablesthe researcher to understand earlier research interests, patterns, and the magnitude of theresearch output and also helps to identify the unexplored areas. As far as the field ofBibliometricsisconcerned,theliteraturesonthissubjectareconstantlygrowing.Therearefew studies which most relevantgiven below.

Ruiz-Sanez, J. and Martinez-Gutierrez, M. (2015) demonstrates the virologyresearch in Latin America has increased. The objective of this study was to evaluateColombianpublicationsonvirusesandviraldiseasesinindexedjournalsduringtheperi odfrom2000to2013.Thetotalnumberofpaperspublishedwas711,ofwhich40.4%wer

publishedinlocaljournals,and59.6%werepublishedinforeignjournals.Theyfoundthat34.2% of the papers were published in collaboration with international researchers, withtheUnited States being themostrepresented.

Baudoin,Landet.al(2019)examinedover28000microbiota-relatedpapersfromthe Web of Science database, their aims to characterize the evolution of publicationpatterns in this field between 1999 and 2017. They found that the substantial increase inthe publications number is accompanied by a broad diversification of associated journalsubject categories and presented trends through thematic structure from the historicalperspective by current systemic approach to host-microbiota relationship inherited fromthe ecological background of the concept of microbiota has opened up a number of newresearchdirections and perspectives.

3. STATEMENTOFTHE PROBLEM

In recent years, the scientometric studies have been undertaken primarily towardsunderstanding the research growth of a subject and its impact. There are very few studieshave been conducted on a virology discipline in a comprehensive manner. Hence thestatementoftheproblemselectedandformulatedforthepresentstudyas**"GlobalResearchTrendsand Scientificproductivity inthefield ofVirologyoverlast threedecades:AScientometricview".**

4. SIGNIFICANTOFTHESTUDY

The growth of scientific literature, inter-disciplinary nature of research and trendstowardsspecializationhasposedmanyproblemsforbothscientistsandlibrarians.Further the development of national and international information systems caused the need for ananalysis of literature used by scientists. In this direction scientometric analysis has nowbecome a well-established part of information research. The Scientometric analysis hasreceivedadequateattentionandithasbeenwidelyappliedtoevaluatetheresearchperformanceoftheresearchersand thegrowthof various sciencedisciplines.

5. OBJECTIVESOFTHESTUDY

1. Toidentityyearwise growthofscientificliteratureinvirologyresearch.
2. ToexaminetheAnnualGrowthRate,AnnualRatioofGrowth, CompoundGrowth Rateand Exponential Growth Rate ofvirology research.
3. TodeterminetheRelativeGrowthRateandDoublingTimeofVirologyliterature.
4. Toexamine theTimeseriesanalysisofvirologyresearch.
5. Toidentifythedocument typeandlanguagewiseanalysisofvirologyresearch.
6. To analyze the citation pattern of publication output of virology research.
7. Tostudytheauthorshippatternandto scrutinize Co-authorship index (CAI), Collaborative Coefficient (CC) and Modified Collaborative Coefficient (MCC).
8. To examine Collaboration index (CI), Rate of single authorship (RSA) and Degree of collaboration (DC)inthefieldofVirology.
9. To identify the most productive and cited authors and ranking them on basis of various indices.
10. Toidentifythemostproductiveandcitedcountriesandrankthemonbasisofactivityindex , immediacyindex, priority and attractiveindex.
11. ToexaminetheapplicabilityofLotka'sauthor productivityLaw and Pareto Principle (80/20 Rule)inthefieldsofVirology.
12. ToexaminetheapplicabilityofZipf'slawofwordoccurrenceinthefieldsofVirology.
13. Toidentifythemostproductive and citedInstitutionsandFundingagenciesatgloballevelinVirology.
14. Tofind most cited papers comparecitationimpact, mentionsandAltmetricAttentionScorein thefield ofVirology.
15. Tobuildco-authorship, co-citation, co-occurrencenetworkvisualizationusingVOSviewer.

6. HYPOTHESES

1. ThegrowthofliteratureonVirologyduringtheperiodofstudyisinincreasingorder.
2. TherelativegrowthrateofresearchoutputonVirologyshowsadecliningtrendanddoubli ngtimeforpublication explainsan increasingtrend.
3. TheArticledocumenttypeofpublicationofVirologyresearchoutputabsorbsthepredom inantplaceincomparisonwithothersourceofpublication.
4. There has been an increasing trend in collaborative research in virology during theresearchperiod.
5. TheimplicationofLotka'slawrelatedwithauthorproductivityinVirologyisnotfollow.
6. ThedistributionofwordoccurrenceinthefieldofVirologyaffirmstheZipf'slaw.
7. The most productive countries have high activity index.
8. There exist Correlation between number of Articles and number of pages.
9. There is no significant Correlations between number of Articles and number of Authors.
10. Thereis no significant CorrelationbetweenBibliometricsimpact(no.Citation)and presenceinsocialmedia(noofmentions).

7. METHODOLOGY

Thedatawerecollectedfromwebofsciencedatabaseusingkeywordsviz.'Virology'tim espan1991-2021afterthatdatarefinedas'JournalofVirology','Virology''Journal of General Virology' and 'Archives of Virology'. The data downloaded as 'plain text' format. Followingthe cleaning and sorting of the data in MS Excel. The software Bibexcel was used to analyze the data and prepare tables to meetthegoals.VOSviewermappingsoftwarewasutilizedextensively fornetworkresearch.

8. TOOLSANDTECHNIQUES

- Bibliometrics indicators
- Bibliometricslaws;Lotka'slaw,Zipf'slawandPricelaw.
- Chi-squaretest
- K-Stest
- Spearmancorrelation

9. LIMITATIONS

The research data published in virology over 30 years in the span of 1991-2021downloadedfromWebofsciencedatabase.Duetoenormityofthedata,thestudyislimitedto only five most productive journals i.e. Journal of Virology, Virology journal,JournalofGeneral Virology and Archives of Virology.

10. CHAPTERIZATION

Theentireresearchoutcomeispresentedinthefollowingchapters:

Chapter-IINTRODUCTION

InthischapterafterintroducingthetopicVirologyandrelateddetails,overviewofBiblio metrics;History,Definition,andApplicationsofBibliometricsanditsmainlawsandindicators. The statement of the problem, Significance of thestudy and Scope of the study is mentioned in this chapter.

Chapter-IIREVIEWOFLITERATURE

This chapter deals with the review of related literature and past studies conductedinthis areaand otherrelated areas.

Chapter-IIIRESEARCHDESIGN

This chapter basically covers Objectives, Scope, limitations, hypotheses, methodology and Statistical tools and software which used duringthestudy.

Chapter-IVDATACOLLECTIONANDANALYSIS

Theresearchdatahasbeencollectedandanalyzedtodeterminethequantificationofresearchoutput,publicationspatternandtheresultsarepresentedinthischapter.

Chapter-V:FINDINGSANDCONCLUSION

Givestheentiresummaryandfindings,conclusionandsuggestionsforfuturestudy.

BIBLIOGRAPHY

At the end, a bibliography arranged alphabetically by authors name is provided inAPAstylemanual.

APPENDIX

PapersPublished

REFERENCES

1. AntonelliGandPistelloM.Virology:Ascientificdisciplinefacingnewchallenges.ClinicalMicro andInfect.2019; 25(2): 133-135p.
2. Koopmans,M.(2013).Viralabundanceanditspublichealthimplications,CurrentOpinionin Virology, 3, 58-60. 2.
3. Ruiz-Sanez, J. and Martinez-Gutierrez, M. (2015). Virology research in a LatinAmerican developing country: a bioliometric analysis of virology in Colombia(2000-2013).JournalofInfectioninDevelopingcountries,9(11),1226-1237.
4. Baudoin, L. & et.al (2019). Scientometric analysis of the term ‘microbiota’ inresearchpublications(1999-2017):asecondyouthofacentury-oldconcept,FEMSMicrobiologyLetters, 366 (12), 1-8.
5. Bhardwaj, R. K. (2016). A scientometric study of world research publications,JournalScientometricResearch, 5(1), 34-42.